DOCUMENT RESUME

ED 459 921 PS 029 995

AUTHOR Clark, Jennifer W.

TITLE Parent-Focused Interventions: A Meta-Analytic Consideration of Risk and Outcome Categories.

PUB DATE 2001-08-25

NOTE 24p.; Paper presented at the Annual Meeting of the American Psychological Association (109th, San Francisco, CA, August 24-28, 2001).

PUB TYPE Numerical/Quantitative Data (110) -- Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS At Risk Persons; *Early Intervention; *Family Programs; Infants; *Meta Analysis; *Parents; *Program Effectiveness; Research Methodology; Toddlers

IDENTIFIERS Program Characteristics; Risk Factors

ABSTRACT

This study explored the potential of meta-analysis for assessing the efficacy of interventions designed for parents of young, environmentally at-risk children. Included in the sample were 232 evaluations of 282 parent-focused interventions implemented between 1965 and 1999; evaluations met 10 criteria, including the inclusion of a treatment and comparison group. Parental risk factors involved low SES, adolescence, low birth weight infants, elevated risk of abuse/neglect, or an emotional problem. Outcomes were child development, home environment, parental knowledge and attitudes, dyadic interaction, caretaking, and abuse/neglect. Effect sizes were calculated by outcome domain for all risk categories combined and separately for the categories of low SES, parental adolescence, elevated abuse/neglect risk, and low birth weight infant. Although the findings fell into a pattern aligning with Olds and Kitzman's (1993) view that adolescent parents and parents of low birth weight infants are two groups especially benefiting from early intervention, no conclusions were drawn about the efficacy of parent-focused interventions due to unanswered questions about measuring the effects of such interventions. Limitations of meta-analysis include its dependence upon the type of information measured and reported in the sampled studies and the substantial amount of inaccuracy in the data involved. Nevertheless, it was thought that meta-analysis can suggest fruitful directions for additional research into intervention in areas where there is adequate information for coding. (Includes 6 tables and 5 figures detailing results.) (KB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 459 921

Parent-Focused Interventions: A Meta-Analytic Consideration of Risk and Outcome Categories

Jennifer W. Clark

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
Jennifer W. Clark
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Poster session presented at the annual meeting
of the American Psychological Association
San Francisco, CA
August, 2001

PS 029995

The research reported in this paper was conducted for my doctoral dissertation. Current contact information for me always can be obtained from the APA or from the secretaries in my former academic department:

Donna Ballock {drb7@psu.edu} or Alice Saxion {avs1@psu.edu}
Department of Human Development and Family Studies
110 Henderson Bldg. South
The Pennsylvania State University
University Park, PA 16802
(814) 865-1447

BEST COPY AVAILABLE

Parent-Focused Interventions: A Meta-Analytic Consideration of Risk and Outcome Categories

The mid-1960s saw a revival of a longstanding idea: A way to intervene with infants and toddlers whose environment puts them at risk of suboptimal development is to intervene with their parents. Since then, numerous narrative reviewers have attempted to assess parent-focused intervention efficacy. A recent work, informed by the authors' clinical experience, was Olds and Kitzman's (1993) review of home visiting programs. The authors pointed to parents of low birthweight babies and adolescent parents as two groups that seemed especially to benefit from intervention, possibly because feelings of vulnerability as parents made them receptive to an offer of help. Among programs for parents of low birthweight babies, positive outcomes were notable in the areas of child development and of home environments that were stimulating.

Olds and Kitzman's (1993) review was unusual in encompassing several risk factors. Typically, a narrative review comprises one risk factor, such as low socioeconomic status, parental youthfulness, or an elevated risk of abuse and neglect. Reviews frequently suffer from an "overlumping" of outcomes, in which measures of disparate domains are put into one "good outcome" category. Even though Olds and Kitzman introduced more complexity than is usual in a narrative review, their work still reflected the limitations faced by a narrative reviewer, who can manage a limited number of studies and who is unable to detect any but the most apparent relations between variables.

In contrast, by using coding for extracting potentially important information from the studies being reviewed, a meta-analytic reviewer can manage and manipulate large quantities of data. This enables the reviewer to make full use of outcome information and to explore interactions as well as main effects. For the present study, meta-analysis was used to test some of the ideas posited by Olds and Kitzman (1993), along with exploring the potential of meta-analysis for assessing the efficacy of interventions designed for parents of young, environmentally at-risk children.

Method

Forming the Sample

An exhaustive literature search was carried out via the following means: electronic data bases, literature reviews, reference lists of studies, Internet resources, on-site searches of two archives, and contacts with program evaluators. Once unearthed, evaluations of parent-focused interventions were included in the analysis if they met all of the following criteria:

- The program was implemented between 1965 and 1999.
- The program was focused on the parent, the parent-child dyad, or the family, with a prominent or sole goal being the improvement of parental behavior or skills as a means of fostering the child's well-being.
- Outcomes measured were of parental knowledge, attitudes or behavior, of the home environment, or of some aspect of the child's development or well-being.

- Outcomes were measured using public or medical records, observations, interviews, or paper-and-pencil tests.
- The research design included a treatment group and a comparison group.
- The risk factor or factors stemmed at least partly from the child's environment (e.g., economic deprivation; adolescent parents), not solely from biological factors (e.g., a low birthweight).
- The program was preventive, not tertiary, in nature.
- The "target child" was three years of age or younger at the beginning of the intervention.
- An identifiable "dose" of intervention was delivered (or intended to be).
- Outcomes were measured and reported in such a way that an effect size could be calculated for at least one outcome.

These qualifications were met by 232 prevention projects which yielded 282 program evaluations (because some projects encompassed more than one discrete program). Other characteristics of the sample are portrayed in Table 1.

Risk Factors and Outcomes

Parental risk factors around which programs had been designed fell into five categories:

- Low socioeconomic status
- Adolescence
- A low birthweight baby (in conjunction with another risk factor)
- An elevated risk of abuse or neglect, identified through a screening procedure
- An emotional problem, including depression, anxiety, and substance abuse

Outcomes were divided into six categories:

- Child development
- Home environment
- Parental knowledge and attitudes
- Dyadic interaction
- Caretaking
- Abuse and neglect

Data Analysis

After effect sizes were calculated as Hedges' g: $\underline{M}_1 - \underline{M}_2/s$ (where $\underline{M}_1$ is the treatment group mean, $\underline{M}_2$ is the comparison group mean, and $\underline{s}$ is the pooled standard deviation), the correction factor $\underline{J}$ was applied to adjust for bias caused by small samples (see Hedges & Olkin, 1985). When an outcome domain had been assessed in a study with more than one measure, an aggregate effect size for that domain was calculated. Within each study, a composite outcome score was calculated by aggregating across all six outcome domains.

Analyses were carried out with a goal of examining the relations between and among groups on the basis of mean effect sizes. Confidence intervals were used for assessing the significance of differences between groups, as recommended by Durlak

(1995). Because a confidence interval specifies all the values of the sample mean for which the null hypothesis ought to be retained, two means can be deemed significantly different from each other if their confidence intervals do not overlap.

For this study, 90% confidence intervals were constructed. A 90% confidence interval entails a 10% (or .1) probability that the population mean falls outside the interval constructed around the sample mean. When assessing the difference between two such means by examining their confidence intervals for overlap, the probabilities are multiplied, meaning that the probability of erroneously rejecting the null hypothesis (that the means do not differ) is .1 multiplied by .1, or .01, yielding a conservative test of significance.

Results

Effect sizes by outcome domain for all risk categories combined are shown in Table 2 and in Figure 1. Outcome domain effect sizes are then shown separately for the risk-factor categories of low socioeconomic status, parental adolescence, elevated risk of abuse and neglect, and low birthweight baby (see Tables 3 through 6 and Figures 2 through 5).

Programs for parents with suboptimal emotional functioning yielded too few studies for a domain-by-domain evaluation of effect sizes. An assessment of the composite outcome variable revealed an effect size of .03, which was based on 14 studies yielding a total n of 592.

Discussion

Answers to questions about possible impacts of parent-focused interventions may vary on the basis of risk factors and of outcome domain. In providing evidence of this possibility, the results of the present study illustrate a strength of the meta-analytic approach. It can pick out significant patterns, across many studies, that would be difficult if not impossible to see using the limited number of studies and the box-score approach of a narrative review.

In fact, anything a narrative review can do, a meta-analytic review can do, and often better. Moreover, when used as a narrative-review follow-up, a meta-analysis can help resolve contradictions or can find empirical support for conclusions, based on a limited sample, that were somewhat tentative. Such was the case in the present study, in which the results fell into a pattern aligning with Olds and Kitzman's (1993) astutely insightful ideas about the risk groups and outcome domains in which intervention effects may be greatest.

When pondering meta-analytic results, however, it is important to be aware of the technique's limitations. Some limitations stem from the fact that a meta-analysis is very much like a primary research study, the fundamental difference being that meta-analytic subjects are research studies rather than people. Consequently, a meta-analysis is plagued by most of the problems to which primary studies are prey. For example, if only a few of the subjects divulge information about an aspect of themselves, the researcher cannot include that aspect in the study's variables. One

such aspect of the programs I reviewed was staff retention over the life of the program, which was mentioned in only a smattering of program evaluation reports.

In addition, a few unique problems inhere. A major one stems from a seemingly simple fact which has far-reaching ramifications for the meta-analyst. His or her "subjects" have decided, a priori, exactly which pieces of information about themselves are worth revealing. In other words, if a variable of interest to the meta-analyst was not measured in any of the studies being analyzed, or if the variable might have been measured routinely but was never reported, then the variable cannot be included in the analysis no matter how important it might possibly be.

These limitations seemed especially acute in the present study which, like meta-analyses commonly conducted in the field of medicine, was an assessment of the apparent effects of a treatment. A difference is that in a medical endeavor, with a goal of affecting physical functioning, a treatment may exert its effects primarily through chemical or mechanical means. In the controlled setting of a medical experiment, it can be a straightforward matter to describe accurately the treatment that was administered.

Matters are not so straightforward in interventions for "high-risk" parents, which usually have a goal of affecting cognitions and behavior. That means that the treatment is inextricably entwined with the personalities of those providing and receiving the treatment, and an interpersonal relationship may be an integral part of the treatment itself. Indeed, theory and research in more than one area of the social science literature suggests that the quality of parent-intervenor relationships may be of paramount importance in determining intervention effectiveness.

It follows that for a meta-analysis of parent-focused interventions, every program evaluation ideally would include variables related to intervenors' and parents' baseline interpersonal and intrapersonal characteristics, intervenors' working conditions, and the nature of intervenor/parent relationships. In reality, as suggested earlier, even proxy variables in some of these areas were so seldom available to me as to be unusable.

Such lacks made themselves felt as I formulated research questions, and they also made themselves felt as I pondered my meta-analytic results. As is true in any quantitative study, a statistically significant result brought on a familiar headache, in that the result was no more than a significant correlation that needed to be interpreted. The throbbing was made worse by the limited range of possible mediator or moderator variables at my disposal. Variables falling in the areas of structural characteristics of the programs and demographic characteristics of parents and intervenor, which were available in enough evaluations to be usable, were limited in their utility.

The conclusions I could draw were limited further by the substantial amount of inaccuracy that I knew surely was in my data. Here, too, there are problems uniquely inherent to the meta-analytic approach. The data for an analysis of the sort I conducted are collected, coded, analyzed, and reported by as many research teams as there are research projects represented in the analysis (232 in mine), with each team having operated independently of the analyst and of each other. Atop all that potential for inaccuracy to creep in, the meta-analyst adds mistake-making potential. Program characteristics must be represented by numeric codes, which entails a surprising amount of estimating and educated guessing. As for calculating effect sizes: A lengthy paper could be written explaining why even the most fastidiously careful coder finds it

distressingly easy to make mistakes (and why it is not possible to goof-proof the process by mechanizing it).

This is not to say that the results of my meta-analysis should be seen as unsound. I feel confident that any inaccuracies in the data are peppered evenly across the categories of my data base. As long as we stay within the data base, then pondering the relative relations of effect sizes across categories seems legitimate and possibly instructive in modest ways.

I only hope that more will not be made of the results than is warranted. In the earliest stages of the study, I had assumed that at study's end, I would draw some sort of conclusion about program efficacy. I now am unwilling to do so, partly because of unanswered questions about measuring the effects of parent-focused interventions. Questions include ones about the validity of measures and about the point in an intervention or in a family's development at which intervention effects are likely to become manifest.

If problems of inaccuracies in the data and questions about outcome measurement were not enough to stop me from addressing the question, "Do these programs 'work'?", then I would be stymied by my inability to define "these programs." My data base includes evaluations of skillfully carried out interventions that probably turned some families' lives around, along with ineptly carried out interventions that might have done more harm than good, and I have no more than a few hints about which is which among the 282 interventions. Because I have virtually no information about parents and intervenor at baseline and across the weeks or months of their relationship, then asking me, "Do these programs 'work'?" would be akin to asking me to analyze the effects of a drug when I had only the haziest idea of what was in the capsules that the research participants had swallowed every day.

If the present study illustrates any point with special clarity, it is that statistical power is not synonymous with explanatory power. True, a meta-analysis can bring an impressive amount of statistical power to bear on the research questions at hand, and yet it will be no better and no more instructive than is the information that went into it. Although it seems to be commonly assumed that a meta-analyis produces a comprehensive overview of an area of the research literature, its view, when compared with that of a primary research study, can be much more limited in important ways.

What a meta-analysis can do, in areas in which there is adequate information for coding, is take a broad sweep through the data and suggest fruitful directions for more fine-grained studies. In this and in other ways, meta-analytic results can be useful. While pondering such results, though, it is wise to remember a comment that Green and Hall made (1984, p. 52) while considering the strengths and weaknesses of the meta-analytic approach: "Statistical methods, to be useful, must be used thoughtfully, [for] data analysis is an aid to thinking, not a substitute."

References

Durlak, J. A. (1995). Understanding meta-analysis. In L. G. Grimm & P. R. Yarnold (Eds.), Reading and understanding multivariate statistics (pp. 319-352. Washington, DC: American Psychological Association.

Green, B. F., & Hall, J. A. (1984). Quantitative methods for literature reviews. Annual Review of Psychology, 35, 37-53.

Hedges, L. V., & Olkin, I. (1985). Statistical methods for meta-analysis. San Diego, CA: Academic Press.

Olds, D. L., & Kitzman, H. (1993). Review of research on home visiting for pregnant women and parents of young children. The Future of Children, 3(3), 53-92.

Table 1

Characteristics of the Sample

Characteristic	
Nature of the Evaluation Report	
Published	159
Dissertation - results not published	35
Unpublished in-house document	70
Unpublished - other types	12
Produced too recently to be categorized	6
Year Evaluation Outcomes First Were Reported	
1970-1974	26
1975-1979	25
1980-1984	53
1985-1989	47
1990-1994	61
1995-2000	70
Risk Factors for Which Programs Were Designed*	
Low SES	124
Adolescence	89
Criteria met for risk of abuse or neglect	52
Emotional problem	14
Low birthweight baby/second risk factor	13
Assignment to Treatment and Comparison Groups	
Random	145
Not random	133
Unknown	4
Site	
Participating parents' home	131
Site established specifically for the intervention	59
Hospital or clinic	39
Other "everyday" locale (e.g., church; school)	26

*Note. Program evaluations, categorized on the basis of risk factors, sum to more than 282 because some programs were designed for parents with two concurrent risk factors.

(Table 1 continued)

Characteristic	
School or program for pregnant/parenting teens	23
Mobile unit (bookmobile-like in nature)	1
Unknown	3
Delivery Mode	
Individual	161
Group	54
Both	64
Unknown	3
Program Approach	
Primarily didactic	88
Primarily supportive	17
Both didactic and supportive	175
Unknown	2
Intervention Duration (in weeks)	
Less than 1	16
2-13	51
14-52	59
53-104	61
105-259	46
260 or more	38
Unknown	11
Intended Number of Intervention Contacts with Participating Parents	
1	13
2-8	51
9-24	54
25-50	45
51-100	38
101-200	38
More than 200	22
Unknown	21

Table 2

Mean Effect Sizes and Confidence Intervals by Outcome Domain

Outcome Domain	Mean ES	90% CI	No. of Studies	Total N
Child Development	.28	.25 - .31	162	16,615
Home Environment	.22[b]	.20 - .24	122	21,941
Parental Knowledge or Attitudes	.20[b]	.17 - .23	134	14,745
Dyadic Interaction	.30[a]	.27 - .33	126	12,179
Caretaking	.19[b]	.16 - .22	69	8,790
Abuse and Neglect	.13*	.11 - .15	61	21,689
All Domains Combined	.28	.26 - .30	282	36,034

Note. Because of rounding, there may be slight discrepancies in Ns, both within and between tables.

[a, b] Means with different superscript letters are significantly different from each other.

*Mean effect size is significantly smaller than are all other mean effect sizes.

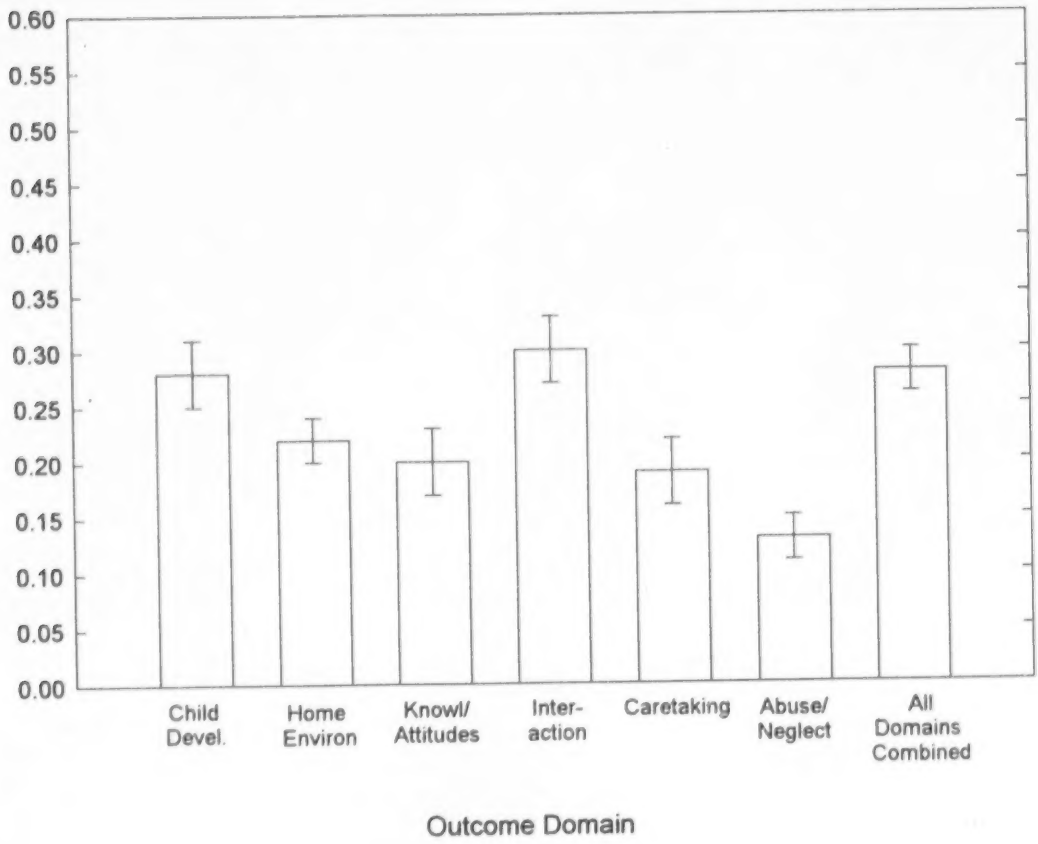

Figure 1. Mean effect size and its confidence interval for each outcome domain.

Table 3

Mean Effect Sizes and Confidence Intervals:
Low-SES Parents Versus All Other Parents

Outcome Domain	Low-SES Parents				All Other Parents			
	Mean ES	90% CI	No. of Studies	Total N	Mean ES	90% CI	No. of Studies	Total N
Child Development	.30[b]	.27 - .33	98	10,306	.24	.19 - .29	64	6,310
Home Environment	.18[a]	.14 - .22	49	8,024	.25	.22 - .28	73	13,918
Parental Knowledge or Attitudes	.20	.15 - .25	46	6,189	.20	.16 - .24	88	8,557
Dyadic Interaction	.36[b]	.32 - .40	58	7,068	.26	.21 - .31	68	5,112
Caretaking	.18	.12 - .24	29	3,500	.20	.15 - .25	40	5,291
Abuse and Neglect	.23	.16 - .30	14	2,033	.10	.07 - .13	47	19,656
All Domains Combined	.33*	.30 - .36	124	13,112	.24	.22 - .26	158	22,922

Note. Because of rounding, there may be slight discrepancies in Ns, both within and between tables.
[a, b] Means with different superscript letters are significantly different from each other.
* Mean effect size for this outcome domain for low-SES parents is significantly larger than is the effect size for all other parents for this domain.

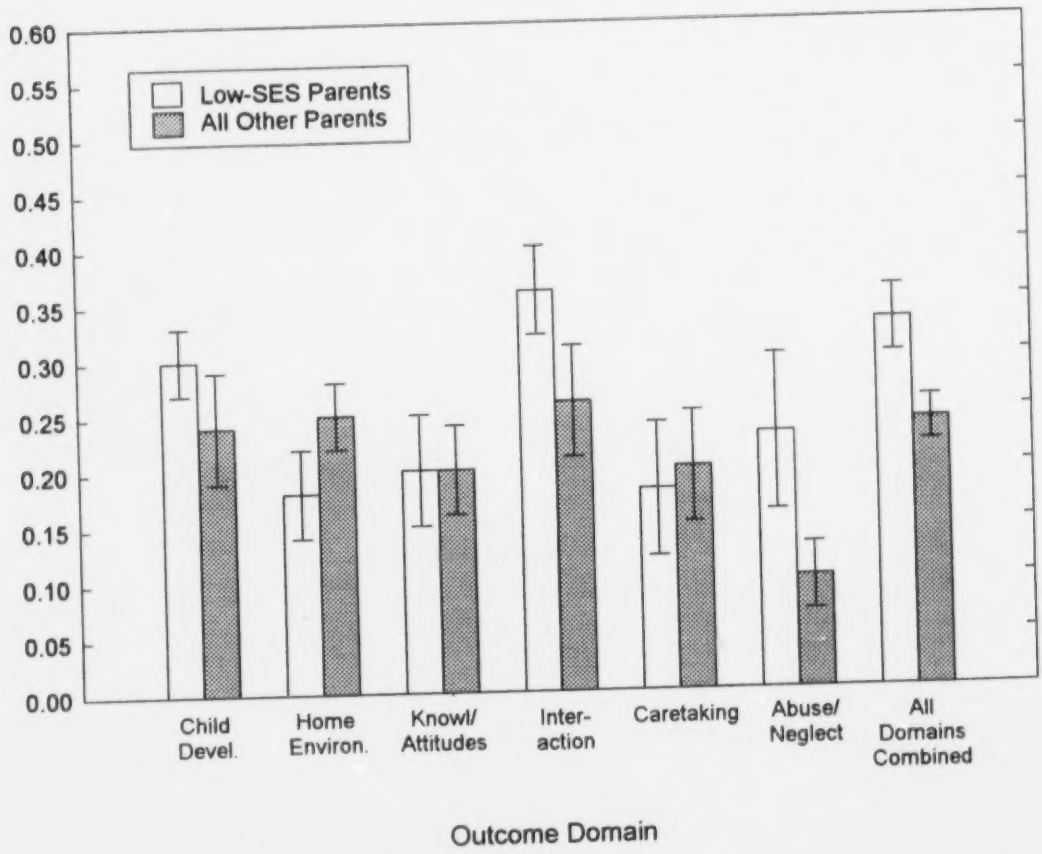

Figure 2. Mean effect size and its confidence interval for each outcome domain for low-SES parents compared with all other parents.

Table 4

Mean Effect Sizes and Confidence Intervals:
Adolescent Parents Versus All Other Parents

Outcome Domain	Adolescent Parents				All Other Parents			
	Mean ES	90% CI	No. of Studies	Total N	Mean ES	90% CI	No. of Studies	Total N
Child Development	.28	.22 - .34	33	3,500	.27	.24 -.30	129	13,116
Home Environment	.27*	.24 - .30	42	9,908	.20	.17 - .23	80	12,034
Parental Knowledge or Attitudes	.31*	.25 - .37	49	3,380	.14	.11 - .17	85	11,366
Dyadic Interaction	.41*	.32 - .50	34	1,900	.26	.23 - .29	92	10,279
Caretaking	.16	.09 - .23	25	2,659	.21	.16 - .26	44	6,132
Abuse and Neglect	.10	.07 - .13	27	11,547	.16	.13 - .19	34	10,143
All Domains Combined	.30	.27 - .33	89	12,121	.26	.24 - .28	193	23,914

* Mean effect size for this outcome domain for adolescent parents is significantly larger than is the effect size for all other parents for this domain.

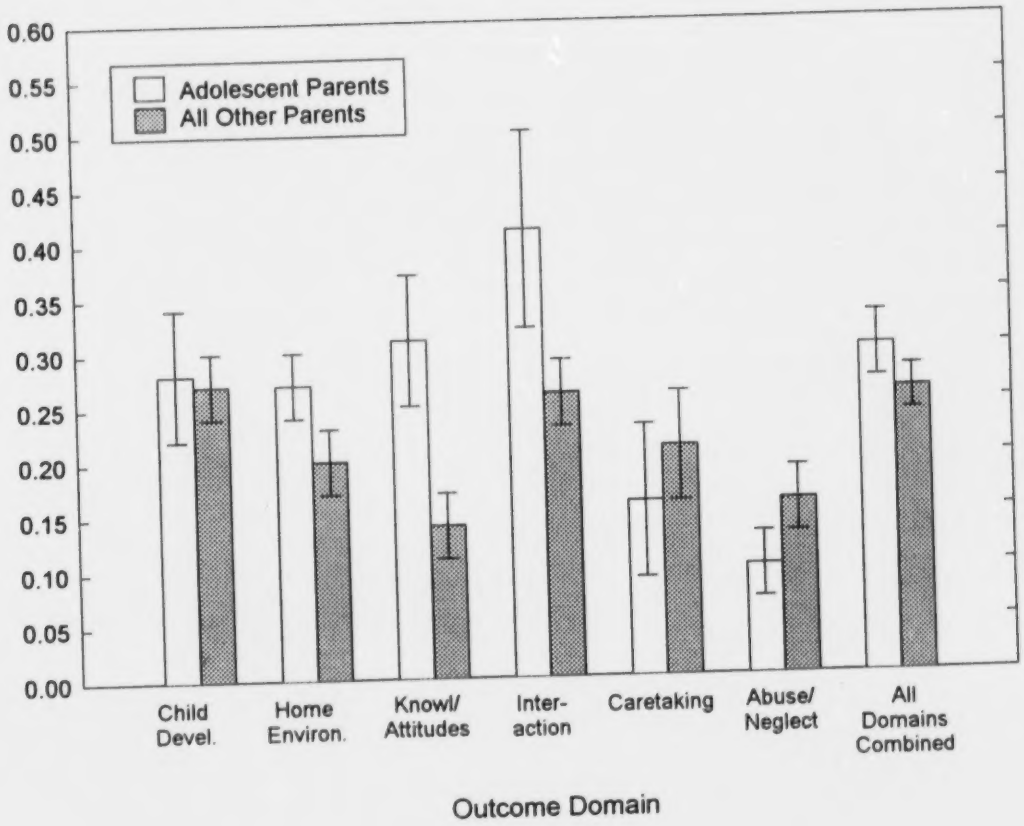

Figure 3. Mean effect size and its confidence interval for each outcome domain for adolescent parents compared with all other parents.

Table 5

Mean Effect Sizes and Confidence Intervals:
Parents Meeting Abuse and Neglect Risk Criteria Versus All Other Parents

Outcome Domain	"At-Risk" Parents				All Other Parents			
	Mean ES	90% CI	No. of Studies	Total N	Mean ES	90% CI	No. of Studies	Total N
Child Development	.09*	.02 - .16	23	2,162	.31	.28 - .34	139	14,454
Home Environment	.23	.17 - .29	24	3,405	.22	.19 - .25	98	18,536
Parental Knowledge or Attitudes	.14	.09 - .19	29	4,757	.22	.18 - .26	105	9,989
Dyadic Interaction	.26	.19 - .33	21	2,810	.31	.27 - .35	105	9,369
Caretaking	.27	.20 - .34	14	2,589	.17	.12 - .22	55	6,202
Abuse and Neglect	.11	.07 - .15	20	8,110	.14	.11 - .17	41	13,580
All Domains Combined	.17*	.13 - .21	52	9,870	.30	.28 - .32	230	26,165

* Mean effect size for this outcome domain for "at-risk" parents is significantly smaller than is the effect size for all other parents for this domain.

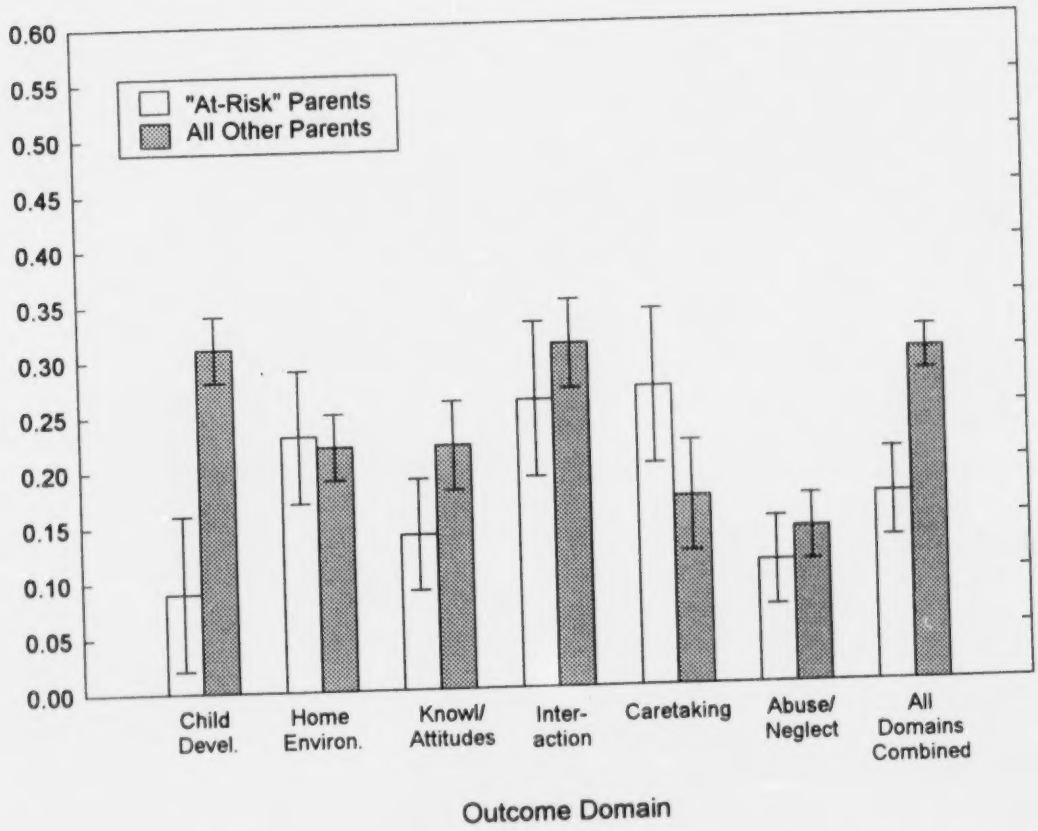

Figure 4. Mean effect size and its confidence interval for each outcome domain for parents meeting abuse and neglect risk criteria compared with all other parents.

Table 6

Mean Effect Sizes and Confidence Intervals:
Parents with a Low Birthweight Baby Versus All Other Parents

	Parents with LBW Baby				All Other Parents			
Outcome Domain	Mean ES	90% CI	No. of Studies	Total N	Mean ES	90% CI	No. of Studies	Total N
Child Development	.45*	.33 - .57	12	810	.26	.23 - .29	150	15,806
Home Environment	.42*	.28 - .56	8	680	.21	.19 - .23	114	21,261
Parental Knowledge or Attitudes	.35	.12 - .58	5	285	.20	.17 - .23	129	14,461
Dyadic Interaction	.26	.03 - .49	7	256	.30	.27 - .33	119	11,924
Caretaking	See note below							
Abuse and Neglect	See note below							
All Domains Combined	.39	.27 - .51	13	854	.27	.25 - .29	269	35,180

Note. There was an insufficient number of studies in this cell for calculating an effect size.
* Mean effect size for this outcome domain for parents with a low birthweight baby is significantly larger than is the effect size for all other parents for this domain.

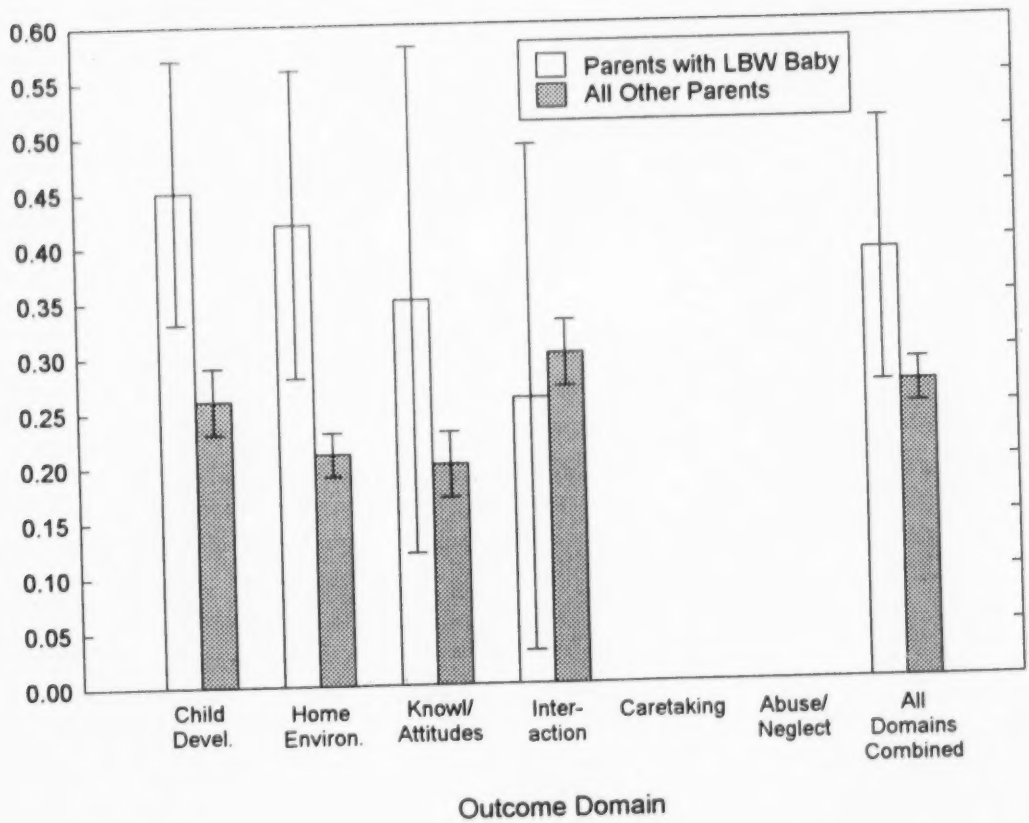

Figure 5. Mean effect size and its confidence interval for each outcome domain for parents with a low birthweight baby compared with all other parents.